Electronic Supplementary Information

Flow-through polymerase chain reaction inside a seamless 3D helical microreactor fabricated utilizing a silicone tube and a paraffin mold

Wenming Wu, a,b,c Kieu The Loan Trinh a and Nae Yoon Lee a

a Department of BioNano Technology, Gachon University, 1342 Seongnam-daero, Sujeong-gu, Seongnam, Gyeonggi-do, 461-701, Korea

b Mechatronics department, University of Saarland, Saarbrücken, Germany

c KIST Europe, GmbH, Campus E7.1, 66123 Saarbrücken, Germany
### Table S1: Some examples of previously developed flow-through PCR microdevices

<table>
<thead>
<tr>
<th>Related references</th>
<th>Dimension</th>
<th>Material</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| This study         | 3D        | Silicone tube   | • Simple and fast fabrication  
• Small footprint  
• Use of a single heater | • Height of the microreactor needs to be precisely controlled |
| Anal. Biochem.     | 3D        | PTFE tube       | • Construction of an integrated system  
• Low cost  
• Fast reaction (10–60 min) | • Use of three heaters  
• Bulky  
• High power consumption |
| Analyst 137, 2069  | 3D        | PDMS–glass      | • Use of a single heater  
• Multiplex PCR  
• Fast reaction (< 25 min) | • Complicated fabrication  
• Require calculation of the microdevice curvature for optimized annealing temperature |
| Analyst 137, 983   | 2D        | PDMS–glass      | • No use of a syringe pump for sample injection  
• Fast reaction (< 30 min) | • Require two heaters  
• Designing of spiral channel structure to equalize sample residence time |
| Sens. Actuators B  | 2D        | PMMA–PC         | • Improved heat tolerance  
• Rapid fabrication  
• Low cost | • Require high temperature for bonding PMMA and PC (165°C, 30 min)  
• Require CO₂-laser micromachining for engraving on PMMA  
• Require complicated temperature control |
| J. Micromech.      | 2D        | PDMS–glass      | • Fast reaction (8–30 min)  
• Low cost | • Complicated fabrication of microheater and microsensor |
| Chem. Eng. J.      | 2D        | PDMS–glass      | • Reproducible results  
• Amplification of large size target (1,460 bp) possible | • Complicated temperature control system needed (six pairs of heaters and sensors)  
• Long reaction time (85 min) |
| Anal. Chem. 81, 302| 2D        | PMMA–PMMA       | • Fast reaction (17 min)  
• Use of a single DNA molecule for amplification | • Complicated design of the microdevice  
• Complicated temperature control system |
| Analyst 136, 2287  | 2D        | PDMS–glass      | • Simple fabrication  
• Small footprint  
• High reproducibility | • Use of multiple heaters  
• High power consumption |